

[REDACTED]

GASOLINE CONTAMINATION OF A PRIVATE WELL SUPPLY. COMMUNITY OF
TAUNTON.

BY: ONTARIO. MINISTRY OF ENVIRONMENT.

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REPORT

Ministry of the Environment

Municipality..... Community of Taunton..... Date of Inspection.....
Re:..... Gasoline Contamination of a Private Well Supply.....
Field Inspection by D. Smith, R. Hodgins..... Report by D. Smith, C.E.T.

INTRODUCTION

In reponse to a request from Mr. H. R. Robinson, Public Health Inspector, staff of the Technical Support Section undertook an investigation to determine the cause and extent of gasoline affecting a private well in the Community of Taunton.

The investigation included an office examination of pertinent data and a field investigation during which two test holes were drilled, samples collected and a levelling survey conducted.

BACKGROUND

Mr. Robinson contacted Mr. Mellary, of this office, on September 24, 1976 to report that two wells owned by a Mr. Lapoussis had an odour of gasoline. The first odours had been noticed approximately two years ago. With time the odours had increased and a new well was recently dug which was also reported to have gasoline odours. The Health Unit was contacted at this point.

On September 29, 1976, staff of the Technical Support Section visited the complainant. Two test holes were drilled as indicated in Figure 1 and water samples collected. Other wells in the immediate area were checked and no evidence of petroleum product was found. At the time of this visit, staff could not detect a petroleum odour in the new well.

The Ministry of the Environment Laboratory confirmed the presence of gasoline in test hole #1 and the old well on October 13, 1976. Ministry staff contacted the Energy Safety Branch of the Ministry of Consumer and Commercial Relations for assistance in checking the gas bar facilities on October 14, 1976.

Since no dip records had been kept at the gas bar, Oilco Maintenance was engaged to check the facilities. On October 25, 1976, two leaks in the piping under the pump island were found. The leaks were repaired and subsequently checked. No water was found in any of the underground storage tanks and no further checks were conducted on these units.

HYDROGEOLOGY

The Community of Taunton is located approximately two miles north of the City of Oshawa and lies about the intersection of County Road 4 and the Town Line.

Lying in the physiographic region known as the South Slope, the area is characterized as a drumlinized till plain (1). The drumlins lie on a north-south orientation. Between the drumlins, the land surface drops to the south at a rate of 1 foot in about 90. Surface streams in the area follow this slope. The Town Line south of County Road 4 follows a ridge between two drumlins.

Since the majority of wells in the area are dug wells, very few well logs exist. The records that are available indicate clay and sandy clay layers interspersed by sand, sandy gravel and gravelly clay layers. The available water is found in the latter formations. The various layers vary from 6 to 15 feet in thickness. The Lapoussis old well is 17 feet deep while the new well was stopped at approximately 10 feet.

At the time of the levelling survey the groundwater flow direction was found to be as shown in Figure 1. It also appears from the topography and levelling survey that a groundwater divide exists in this area which roughly corresponds to the ridge.

DISCUSSION

The Lapoussis old well and test hole #1 were shown by the Ministry laboratory to contain gasoline.

Gasoline is a refined petroleum product and does not occur naturally in ground water. When gasoline is spilled, it percolates downward under the influence of gravity until the water table is encountered. The gasoline then spreads on the water table and moves in the direction of groundwater flow. Thus, product lost at the gasoline pumps would move south in the direction of the Lapoussis property.

At the time of investigation, September 29, 1976, the static level in the Lapoussis old well was 7.56 feet. Generally September, October is the low water table period of the year. Thus, it is evident that at some times during the year, building foundations will exercise some control over groundwater flow directions. This may explain the difference in concentration of 10 ppm gasoline in test hole #1 and 1 ppm gasoline in the Lapoussis old well.

- (1) (Chapman, L.J. Putnam, D.F. "The physiography of Southern Ontario", University of Toronto Press, 1966).

Pumping and the subsequent cone of influence created around a well tend to draw a contaminant towards the well. It is therefore encouraging to see only 1 ppm of gasoline in the Lapoussis old well as opposed to the much higher value in test hole #1. The levels of gasoline being encountered create problems with taste and odour but do not pose any threat to health.

In the Lapoussis new well staff could not detect any odour of a petroleum product nor could the laboratory find any trace of a petroleum product. Since odours have existed in the old well for approximately two years and the concentration is low, it is not felt that wells south of the Lapoussis property will encounter any problems. Additionally the small creek east of the Lapoussis residence is a discharge point for the water table as shown by the flow direction. Thus, any contaminant lost north of the Lapoussis property should ultimately discharge in the creek.

The general water chemistry is given in Table 1. It can be seen that the water is very hard and has elevated chlorides. The hardness is natural for the area but the chlorides are probably a result of road salting on County Road 4 and the Town Line. However, the chloride level encountered is within recommended limits.

It was noted by Ministry staff that the tiles used for the new well appear to be of very fresh cement. Improperly cured well tiles can themselves create taste, odour and general chemical problems with a water supply.

CONCLUSIONS

- 1) The Lapoussis well has been contaminated by gasoline lost on the gas bar property.
- 2) Although a considerable area has been contaminated, no other wells have been affected to date, nor does it appear likely that other wells will be affected.

ALTERNATE SUPPLIES

The following alternatives for the restoration of a potable water supply to the Lapoussis property may be considered:

- 1) Because the concentration of gasoline is low in the old well, an activated charcoal filter could be employed to remove the taste and odours. It should be noted, however, that the old well is a stone-lined dug well. This type of well is subject to bacterial contamination at times of heavy rainfall or during the spring runoff. Since the activated charcoal filter can act as a growth medium for bacteria, it may be necessary to install an automatic chlorinator in front of the filter.

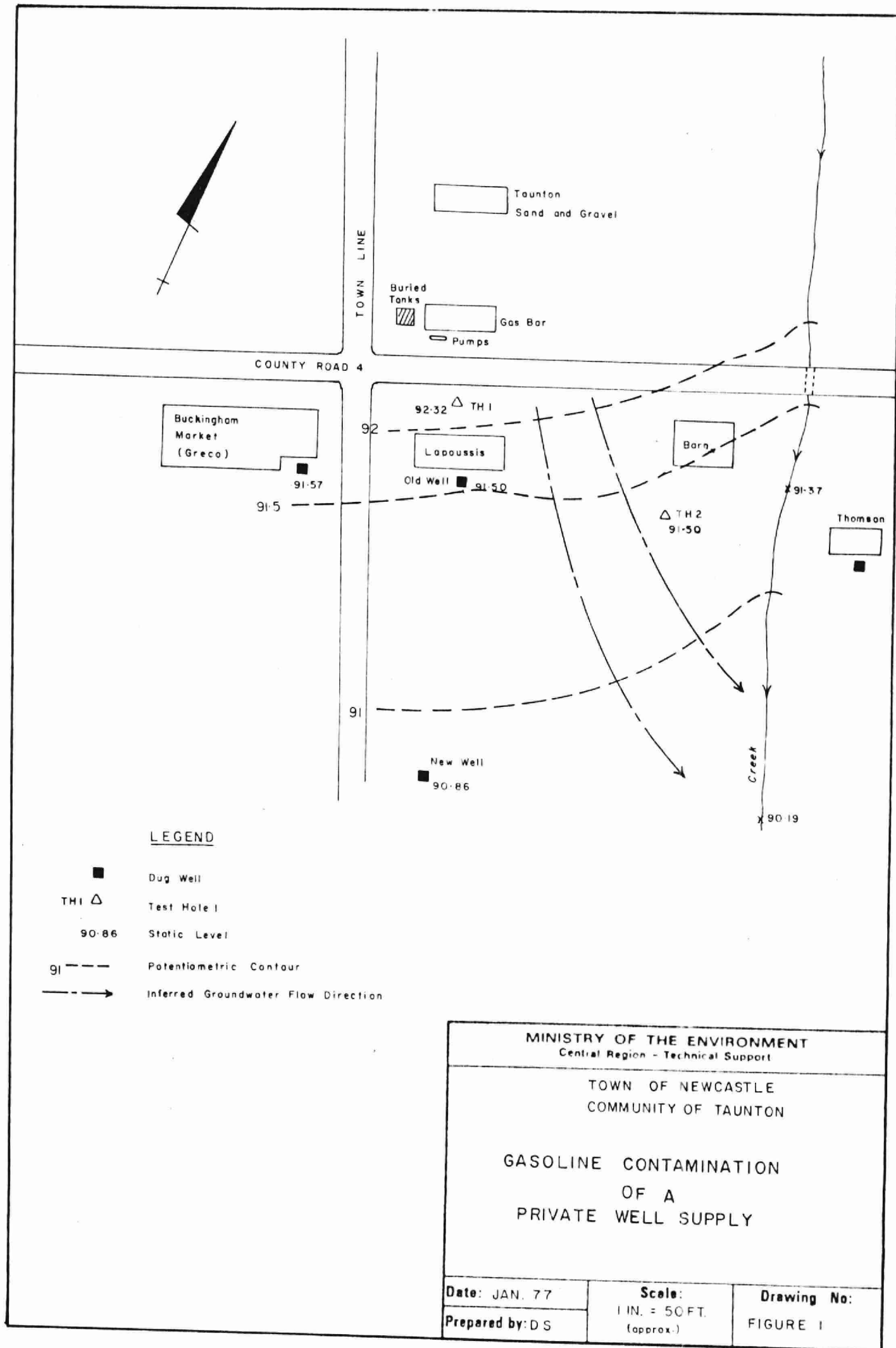
- 2) The new well which was not completed, is probably in the most favourable location to avoid contamination. This well could be completed to provide a potable supply of water. Although it was reported that this well had a petroleum odour, Ministry staff could not detect any odour nor could the laboratory find any indication of gasoline in the water sample submitted from the well.
- 3) A cistern could be installed and water delivered on a regular basis.

RECOMMENDATIONS

Although the underground storage tanks at the gas bar appear to be sound, they have been in the ground for a considerable period of time. It is imperative that dip records be maintained to point out any future problems quickly. Also consideration could be given to replacing the tanks now. Installation of new tanks would greatly reduce the possibility of a fresh leak in the near future.

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